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2009 SMALL GAME HARVEST SURVEY

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Abstract

A survey was completed to estimate the number of people hunting small game, their days afield, and harvest during the 2009-2010 Michigan hunting seasons. The survey also was used to investigate hunter satisfaction, compliance with the Harvest Information Program (HIP), and to investigate issues related to waterfowl hunter recruitment and retention. In 2009, 266,549 people purchased small game hunting licenses, a decrease of about 2% from 2008. An estimated 166,068 people actually hunted small game species in 2009, which was a decrease of about 10% from 2008. Small game hunters most often sought ruffed grouse, squirrels, and cottontail rabbits. The number of hunters pursuing quail, woodcock, snowshoe hare, crow, and coyote did not change significantly between 2009 and 2008; however, fewer hunters sought pheasant (-21%), squirrels (-11%), rabbit (-10%), and grouse (-9%). Hunting effort did not change significantly for any species between 2008 and 2009; however, harvest declined significantly statewide for pheasant (-43%), grouse (-20%), and squirrels (-19%). Compared to 2008, a smaller proportion of small game hunters in 2009 were satisfied with their overall small game hunting experience (59% in 2009 versus 65% satisfied in 2008. Moreover, smaller proportions of small game hunters were satisfied with the amount of small game seen (37% versus 45%) and game harvested (29% versus 35%). In 2009, 92% of migratory bird hunters registered with HIP. About 20% of Michigan small game hunting license buyers hunted waterfowl in 2009. About 23% of small game license buyers (60,882) were not currently involved with waterfowl hunting but could see themselves becoming a waterfowl hunter in the future. About 42% of the people hunting waterfowl in Michigan during 2009 indicated they were currently a mentor for another waterfowl hunter and 53% had previously been a mentor.

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INTRODUCTION

The Natural Resources Commission and the Michigan Department of Natural Resources (DNR) have the authority and responsibility to protect and manage the wildlife resources of the state of Michigan. This responsibility is shared with the U.S. Fish and Wildlife Service (USFWS) for managing migratory species such as woodcock (*Scolopax minor*), ducks (Anatinae), and geese (*Branta* and *Anser* spp.). Harvest surveys are one of the tools used by the DNR to accomplish its statutory responsibility. Estimates derived from harvest surveys, as well as other indices of abundance, are used to monitor game populations and help establish harvest regulations.

Since the 1950s, the primary small game species harvested in Michigan have been ring-necked pheasant (*Phasianus colchicus*), ruffed grouse (*Bonasa umbellus*), American woodcock, cottontail rabbit (*Sylvilagus floridanus*), snowshoe hare (*Lepus americanus*), squirrels (*Sciurus* spp. and *Tamiasciurus hudsonicus*), and American crow (*Corvus brachyrhynchos*) (Frawley 2011a). Most of these animals could be harvested during fall and early winter (Table 1) by a person possessing a small game hunting license (includes resident, nonresident, 3-day nonresident, resident junior, and senior small game hunting licenses). Coyotes (*Canis latrans*) could be harvested in Michigan by hunters possessing either a small game hunting (residents) or a fur harvesters license (residents and nonresidents). Coyotes also may be taken without a license on private property by a property owner or their designee if they are doing or about to do damage on their property. Woodcock hunters were required to register with the National Migratory Bird Harvest Information Program (HIP). Landowners and their families that hunted small game on their property where they resided could hunt without a hunting license, although they still needed to register with HIP if they hunted migratory game birds.

Waterfowl could be harvested by a person possessing both a waterfowl and a small game hunting license. Waterfowl hunters also had to obtain a federal waterfowl stamp and register with the HIP. Hunters younger than 16 years of age could hunt waterfowl without a waterfowl hunting license or a federal waterfowl stamp; however, they still were required to purchase a small game license and register with the HIP.

The HIP is a cooperative effort between state wildlife agencies and the USFWS. It was implemented to improve knowledge about harvest of migratory game birds. Beginning in 1995, any person who hunted migratory game birds in Michigan was required to register with HIP and answer several questions about their hunting experience during the previous year. The HIP provided the USFWS with a national registry of migratory bird hunters from which they can select participants for harvest surveys.

Estimating harvest, hunter numbers, and hunting effort were the primary objectives of the small game harvest survey. This survey also provided an opportunity to collect information about management issues. Questions were added to the questionnaire to investigate hunter satisfaction with the 2009 hunting season and small game numbers.

In recent years, the numbers of waterfowl hunters has declined in Michigan and throughout the United States (Frawley 2011b). In order to address declining hunter numbers, the National Flyway Council created a Waterfowl Hunter Recruitment and Retention working group to provide information about waterfowl hunter recruitment and retention throughout the United States. Thus, questions were added about waterfowl hunting activity in Michigan and other states to gather information useful for understanding waterfowl hunter recruitment and retention.

METHODS

Following the 2009 small game hunting seasons, a questionnaire (Appendix A) was sent to 9,992 randomly selected people that were eligible to hunt small game. Hunters reported species hunted, county hunted, type of land on which hunt occurred (public or private lands), number of days spent afield, and number of animals harvested. In addition, hunters were asked whether they had hunted waterfowl and to rate their overall hunting experience and indicate their satisfaction with the amount of game seen and amount harvested, and number of days in the hunting season.

Estimates were calculated using a stratified random sampling design (Cochran 1977). Using stratification, hunters were placed into similar groups (strata) based on their county of residence. Residents of the Upper Peninsula (UP), Northern Lower Peninsula (NLP), Southern Lower Peninsula (SLP), and nonresidents and licensees with unknown residency were grouped into separate strata (Figure 1). The overall sample consisted of 1,139 people from the UP stratum (N= 30,312), 2,343 people from the NLP stratum (N= 61,935), 6,069 from the SLP stratum (N= 163,214), and 441 people from the nonresident and unknown residency stratum (N=11,088). Estimates were derived for each group separately. The statewide estimate was then derived by combining group estimates so the influence of each group matched the proportion its members contributed to the statewide population of hunters. The primary reason for using a stratified sampling design was to produce more precise estimates. Improved precision means similar estimates should be obtained if this survey were to be repeated.

Coyotes could be harvested in Michigan by hunters possessing either a small game hunting (residents) or a fur harvesters license (residents and nonresidents). The DNR sells hunting licenses using a statewide automated license sales system. This system allowed the DNR to maintain a central database containing license sales information (e.g., sales transactions) for each license buyer. Using the license sales database, small game hunting license buyers that also purchased a fur harvesters license were identified, and then coyote harvest was estimated separately for small game licensees with and without a fur harvesters license. The license sales database also was used to identify whether small game hunting licensees had registered with HIP. Using this information, estimates of compliance with HIP among small game hunting license buyers hunting migratory species (woodcock and waterfowl) was estimated.

Estimates were derived separately for the UP, NLP, and SLP (Figure 1). Hunting effort and animals harvested from unknown locations were allocated among areas in proportion to the effort and harvest estimated from known locations.

Estimates were subject to both sampling and nonsampling error. When a sample rather than the entire population has been surveyed, there is a chance that the sample estimates may differ from the true population values they represent. The difference, or sampling error, varies depending on the particular sample selected, and this variability was measured by the 95% confidence limit (CL). In theory, this CL can be added and subtracted from the estimate to calculate the 95% confidence interval. The confidence interval was a measure of the precision associated with the estimate and implies the true value would be within this interval 95 times out of 100.

Estimates also were affected by nonsampling error. Nonsampling error can occur for many reasons, including the failure to include a segment of the population, the inability to obtain data from all units in the sample, the inability or unwillingness of respondents to provide data, mistakes made by respondents, and errors made in the collection or processing of the data. It is very difficult to measure this error. Thus, estimates were not adjusted for nonsampling error. Furthermore, harvest estimates did not include animals taken legally outside the open season (e.g., nuisance animals) and by unlicensed landowners and their family that legally hunted on their own land.

Statistical tests are used routinely to determine the likelihood the differences among estimates are larger than expected by chance alone. The overlap of 95% confidence intervals was used to determine whether estimates differed. Non-overlapping 95% confidence intervals was equivalent to stating the difference between the means was larger than would be expected 995 out of 1,000 times ($P < 0.005$), if the study had been repeated (Payton et al. 2003).

Questionnaires were mailed initially in mid-May. Up to two follow-up questionnaires were sent to non-respondents. Questionnaires were undeliverable to 209 people, primarily because of changes in residence. Questionnaires were returned by 5,586 people, yielding a 57% adjusted response rate.

RESULTS AND DISCUSSION

License sales and hunter participation

In 2009, 266,549 people purchased small game hunting licenses, a decrease of about 2% from 2008 (Table 2). About 62 ± 1% of the licensees actually hunted in 2009 (Tables 2 and 3), which was lower than estimated in 2008 (68%). An estimated 166,068 people actually hunted small game species in 2009 (excluded people hunting waterfowl only), which was a significant decrease of about 10% from 2008 (Table 3). About 97% of the active small game hunters were males (Table 3). Hunters most often sought ruffed grouse, squirrels, and cottontail rabbits (Table 4). In 2009, the average age of small

game license buyers was 43 years (Figure 2). Nearly 11% (30,223) of the license buyers were younger than 17 years old.

Harvest and hunting trends

The number of hunters pursuing quail, woodcock, snowshoe hare, crow, and coyote did not change significantly between 2009 and 2008; however, fewer hunters sought pheasant (-21%), grouse (-9%), rabbit (-10%), and squirrels(-11%,Table 4). Hunting effort did not change significantly for any species between 2008 and 2009 (Table 5). In contrast, harvest declined significantly statewide for pheasant (-43%), grouse (-20%), and squirrels (-19%, Table 6).

Coyotes could be harvested in Michigan by hunters possessing either a small game hunting (residents) or a fur harvesters license (residents and nonresidents). In 2009, an estimated 34,656 small game hunters pursued coyotes (Tables 4 and 7). About 74% of these hunters possessed only a small game hunting license (Table 7), and they were responsible for 65% of the coyotes taken by all small game license holders.

The number of small game hunters in Michigan has declined about 75% since the mid-1950s and is currently at a record low (Figure 3). This trend has been previously reported in Michigan and nationally (Brown et. al. 2000, Enck et al. 2000, Frawley 2006, U.S. Department of the Interior 2008). Hawn (1979) speculated declining ring-necked pheasant populations was the primary reason for declining small game hunter numbers in Michigan. The number of people hunting pheasants has declined by about 90% between the mid-1950s and recent years (Figure 4). Many other factors have contributed to the decline of small game hunting, including increased urbanization of the human population, increased competition between hunting and other leisure activities, and loss of wildlife habitat (Brown et al. 2000).

Declining small game hunting participation since the mid-1950s also has been noted among hunters pursuing cottontail rabbits (-80%), snowshoe hare (-75%), and squirrels (-65%, Figure 4). Changes in hunter participation and harvest were generally similar.

Hunter numbers in the 1970s through the early 1980s were likely affected by the initiation and subsequent elimination of the put-take pheasant program (Figure 5). This program was created for the purpose of providing additional pheasant hunting opportunities. Each year while the program existed, pen-raised pheasants were released on several state properties in southern Michigan (Janson 1975, Janson and Anderson 1976).

Changes in the harvest of game species and hunter participation often track changes in game populations. The number of hunters that pursued pheasants, rabbits, snowshoe hares, and squirrels was at record low levels during recent years (Figure 4). Game population surveys have indicated pheasant, quail, and woodcock populations are currently among their lowest recorded levels since the 1960s (Frawley and Stewart 2008, Cooper and Parker 2010). The abundance of rabbit, hare, and squirrels was not monitored annually; thus, it was not possible to determine whether harvest and population trends were similar. Michigan's

grouse population generally follows a cyclic pattern lasting about 10 years, and the grouse population in 2009 appeared to be increasing after reaching the low in the present cycle during 2004-2005 (Frawley and Stewart 2009). Hunter numbers and the number of grouse harvested have followed a similar cyclic pattern. The decline in crow hunters and their hunting effort in Michigan may reflect declining crow numbers as a result of the recent emergence of West Nile virus in North America (LaDeau et al. 2007).

Although many small game species are not as abundant today as during previous decades (e.g., pheasant, quail, woodcock), the mean number of animals taken per hunting effort has not paralleled changes in the population (Figure 6). For example, hunting efficiency has been high among hunters despite declining numbers of pheasant and woodcock.

About 31% of the small game hunters in Michigan hunted on private lands only, 22% hunted on public lands only, and 40% hunted on both private and public lands (Table 8). Private lands served as the primary area for hunters pursuing pheasants, quail, cottontail rabbits, crows, and coyotes (Tables 8 and 9), while public lands were most popular among hunters pursuing grouse, woodcock, and snowshoe hares.

Hunter satisfaction

Compared to 2008 (Frawley 2011a), a smaller proportion of small game hunters in 2009 were satisfied with their overall small game hunting experience (59% in 2009 versus 65% satisfied in 2008, Table 10). Moreover, smaller proportions of small game hunters were satisfied with the amount of small game seen (37% versus 45%) and small game harvested (29% versus 35%).

Migratory bird hunters and Harvest Information Program (HIP) compliance

An estimated 81,573 ± 3,168 small game hunters hunted migratory birds (waterfowl and woodcock combined) in Michigan during 2009, compared to 83,790 ± 3,207 in 2008. An estimated 53,553 ± 2,766 hunters pursued waterfowl, and 37,693 ± 2,378 hunters pursued woodcock in 2009. The number of waterfowl and woodcock hunters combined in 2009 was not statistically different from the 2008 estimate.

In 2009, 92 ± 1% of migratory bird hunters had registered with HIP. About 97 ± 1% of the waterfowl hunters and 87 ± 2% of the woodcock hunters had registered with HIP. Compliance among hunters was unchanged from the rate of compliance in 2008 (Frawley 2011a). Hunters registered with HIP were responsible for about 91% of the woodcock taken and 87% of the woodcock hunting trips done in 2009 (Table 11). Waterfowl hunters were not asked to report their harvest and hunting effort; thus, it was not possible to estimate harvest and effort for waterfowl among HIP registrants.

Cooper and Parker (2010) reported estimates of harvest, hunter numbers, and hunting effort of Michigan woodcock hunters in 2009 from a USFWS survey. These estimates were based on responses received from a random sample of HIP registrants. Cooper and Parker estimated 26,400 ± 4,000 hunters went afield 146,200 ± 30,700 days and harvested

80,900 ± 17,800 woodcock. Estimates of hunter number and hunting effort were less than estimates from the present survey (Tables 4-6). Because about 13% of Michigan woodcock hunters failed to register with HIP, the estimates derived from the USFWS survey would be expected to be lower than estimates from the present survey. Estimates of harvest derived from a subset of Michigan hunters that had registered with HIP (Table 11) was not significantly different from estimates from the USFWS survey; however, estimates of hunter numbers and hunting effort were significantly greater in this survey compared to estimates made by the USFWS. This difference may reflect unknown differences in the way the surveys were implemented.

The USFWS conducted a survey of HIP registrants and estimated 47,800 ± 4,300 people hunted waterfowl in Michigan in 2009 (Raftovich et. al. 2010). The estimated number of waterfowl hunters derived from the current survey (53,553) was not significantly different from the USFWS estimate.

Waterfowl hunting

Frawley (2011b) estimated 50,064 ± 1,031 waterfowl hunters in Michigan during 2009 from the waterfowl harvest survey. In contrast, this current survey estimated 53,553 people hunted waterfowl. The previous estimate was obtained from a separate survey sent to a random sample of waterfowl license buyers and HIP registrants younger than 17 years old. The estimate from this small game harvest survey included a larger population of hunters, including many hunters that were not licensed to hunt waterfowl. Despite the differences in survey populations, the estimates of waterfowl hunters from the two surveys were not significantly different.

An estimated 2,659 ± 693 youth hunters (10-15 years old) participated during the 2-day youth waterfowl hunting season. About 15 ± 3% of the youth hunters eligible to hunt during the youth season actually participated. Frawley (2011b) estimated 3,146 ± 461 youth hunters hunted during the 2-day youth waterfowl hunting season in 2009. Estimates from this current survey did not differ from the estimates from the waterfowl harvest survey.

About 20% of Michigan small game hunting license buyers hunted waterfowl in 2009 (Table 12). Although most of these license buyers did not hunt waterfowl in 2009, a large number of these license buyers had hunted waterfowl during previous years. About 23% of small game license buyers (60,882) were not currently involved with waterfowl hunting but could see themselves becoming a waterfowl hunter in the future (Table 13). This group of potential waterfowl hunters is larger than the number of people hunting waterfowl in Michigan during 2009. These data suggest there is potential to recruit waterfowl hunters among active small game hunters not currently participating in waterfowl hunting.

Among the people hunting waterfowl in Arkansas, Illinois, Michigan, and Virginia during 2009, nearly 70-80% of the hunters in these states considered themselves waterfowl hunters (Table 14). In addition, 10-15% of the people hunting waterfowl in these states indicated they were still learning how to become a waterfowl hunter. In contrast, 10-20% of the people hunting waterfowl in these states did not consider themselves as a waterfowl hunter.

About 25% of the 2009 small game license buyers reported they planned to hunt waterfowl during the next five years; whereas, 80% of the people that hunted waterfowl in 2009 were very likely to hunt waterfowl again during the next five years (Table 15). About 80-90% of the people hunting waterfowl in Arkansas, Michigan, and Virginia during 2009 indicated they were very likely to hunt waterfowl during the next five years (Table 16).

About 42% of the people hunting waterfowl in Michigan during 2009 indicated they were currently a mentor for another waterfowl hunter, and 53% had previously been a mentor to another waterfowl hunter (Table 17). Overall, about 60% of the active waterfowl hunters in 2009 currently or formerly were a mentor to another waterfowl hunter. About 40-50% of the people hunting waterfowl in Arkansas, Illinois, Michigan, and Virginia during 2009 were currently a mentor to another waterfowl hunter and 50-65% had formerly been a mentor to another hunter (Table 16).

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Table 1. Small game hunting seasons in Michigan, 2009-2009.

Species, season, and area[a]	Season dates
Ring-necked pheasant	
Upper Peninsula (Zone 1)	Oct. 10 – 31
Lower Peninsula (Zone 2)	Oct. 20 – Nov. 14
Lower Peninsula (Zone 3)	Oct. 20 – Nov. 14 and Dec. 1 – Jan. 1
Northern bobwhite quail	
Southern Lower Peninsula	Oct. 20 – Nov. 14
Ruffed grouse	
Statewide	Sept. 15 – Nov. 14 and Dec. 1 – Jan. 1
American woodcock	
Statewide	Sept. 19 – Nov. 2
Cottontail rabbit	
Statewide	Sept. 15 – March 31
Snowshoe hare	
Statewide	Sept. 15 – March 31
Squirrels	
Statewide	Sept. 15 – March 1
American crow	
Statewide	Aug. 1 – Sept. 30 and Feb. 1 – March 31
Coyote	
Zone 1	July 15 – Nov. 14 and Dec. 1 – April 15
Zones 2 and 3	July 15 – April 15

[a]See Figure 1 for boundaries of hunt areas.

Table 2. Number of small game hunting licenses sold in Michigan, 2005-2009.

Item	Year					2008-2009 % Change
	2005	2006	2007	2008	2009	
Number of licenses sold[a]	291,948	300,099	298,685	277,215	270,594	-2
Number of people buying a hunting license[b]	287,562	295,369	293,662	273,243	266,549	-2

[a]The number of licenses sold is higher than the number of people buying licenses because some people purchased multiple licenses.
[b]A person was counted only once, regardless of how many licenses they purchased.

Table 3. Estimated sex and age of active small game hunters in Michigan, 2005-2009.[a]

Variable	2005	2006	2007	2008	2009	
					Estimate	95% CL
Hunters[b]	196,501	207,981	188,297	184,474	166,068	3,342
Males (%)	96.9	97.1	95.9	96.4	96.6	0.6
Females (%)	3.1	2.9	3.7	3.6	3.4	0.6
Age (Years)[c]	43.3	43.2	43.8	44.7	44.9	0.6

[a]Analyses included only those people that hunted.
[b]People that hunted American crow, American woodcock, cottontail rabbit, coyote, northern bobwhite quail, ring-necked pheasant, ruffed grouse, snowshoe hare, or squirrels. Coyote hunters were not included in estimate of small game hunters prior to the 2008 estimate.
[c]Mean age of active hunters on October 1.
*Non-overlapping 95% confidence intervals indicated estimates differed significantly between the last two years (P<0.005).

Table 4. Estimated number of small game hunters by species and region hunted in Michigan, 2006-2009.[a]

Species and region	2006	2007	2008	2009 No.	2009 95% CL	2008-09 % Change
Ring-necked pheasant[b]						
UP	3,004	2,019	2,378	2,226	599	-6
NLP	19,691	16,331	15,290	11,762	1,348	-23*
SLP	36,964	30,218	27,795	22,057	1,838	-21*
Statewide	56,192	45,669	43,144	34,014	2,310	-21*
Northern bobwhite quail						
NLP	256	279	4	166	162	>100*
SLP	2,462	1,455	1,052	1,352	465	28
Statewide	2,718	1,578	1,056	1,373	502	30
Ruffed grouse						
UP	38,221	38,677	39,356	36,518	1,832	-7
NLP	47,647	45,127	46,730	43,561	2,424	-7
SLP	14,199	11,138	11,200	9,578	1,264	-14
Statewide	92,698	88,727	91,417	82,818	2,987	-9*
American woodcock						
UP	11,544	9,695	11,068	11,371	1,298	3
NLP	23,254	24,418	26,154	23,969	1,903	-8
SLP	8,014	6,875	7,271	5,748	984	-21
Statewide	39,618	37,875	41,052	37,693	2,378	-8
Cottontail rabbit						
UP	3,941	4,158	3,976	3,875	784	-3
NLP	28,247	22,682	23,309	19,187	1,665	-18*
SLP	64,005	59,602	52,642	49,098	2,510	-7
Statewide	89,703	82,647	75,455	67,883	2,981	-10*
Snowshoe hare						
UP	10,243	8,911	7,726	8,780	1,149	14
NLP	11,976	6,739	7,678	7,172	1,068	-7
SLP	2,322	1,412	1,599	1,198	453	-25
Statewide	23,566	16,593	16,507	16,387	1,625	-1
Squirrels						
UP	4,305	6,329	5,596	4,563	846	-18
NLP	41,965	32,967	33,009	29,341	2,022	-11
SLP	58,476	48,435	47,771	43,698	2,414	-9
Statewide	98,373	83,487	81,736	73,016	3,061	-11*
American crows						
UP	1,283	1,079	1,177	1,653	531	40
NLP	4,582	4,859	4,336	4,334	848	0
SLP	8,558	7,924	6,746	7,486	1,141	11
Statewide	13,699	13,379	11,812	12,944	1,493	10
Coyote						
UP	4,557	3,168	3,875	4,310	829	11
NLP	14,709	12,563	12,783	13,930	1,467	9
SLP	16,794	16,627	16,718	18,164	1,703	9
Statewide	33,182	30,369	31,289	34,656	2,332	11

[a]The number of hunters does not add up to the statewide total because hunters can hunt in more than one region.
[b]Included both regular and late pheasant hunting seasons.
*Non-overlapping 95% confidence intervals indicated estimates differed significantly (P<0.005).

Table 5. Estimated amount of small game hunter effort (days afield) by species and region, 2006-2009.

Species and region	2006	2007	2008	2009 No.	2009 95% CL	2008-09 % Change
Ring-necked pheasant[a]						
UP	17,728	11,024	13,411	10,658	4,182	-21
NLP	73,670	57,056	58,064	45,250	8,031	-22
SLP	149,123	109,096	108,718	92,285	13,214	-15
Statewide	240,521	177,176	180,193	148,194	17,415	-18
Northern bobwhite quail						
NLP	970	2,048	7	698	758	>100
SLP	8,172	3,663	3,422	5,084	2,611	49
Statewide	9,142	5,711	3,428	5,781	2,930	69
Ruffed grouse						
UP	273,177	335,400	325,116	299,237	29,404	-8
NLP	302,392	238,393	244,730	238,137	24,128	-3
SLP	72,545	72,843	54,329	45,508	10,604	-16
Statewide	648,114	646,636	624,175	582,881	40,943	-7
American woodcock						
UP	60,543	70,993	58,633	76,358	14,473	30
NLP	139,342	121,955	144,577	125,296	18,096	-13
SLP	38,933	26,290	36,142	26,085	8,768	-28
Statewide	238,819	219,238	239,352	227,738	25,733	-5
Cottontail rabbit						
UP	20,713	31,356	22,994	22,782	8,583	-1
NLP	146,278	103,912	122,123	107,926	19,501	-12
SLP	457,310	364,908	306,463	283,916	36,537	-7
Statewide	624,301	500,176	451,580	414,624	43,343	-8
Snowshoe hare						
UP	51,238	77,972	49,280	55,671	13,053	13
NLP	72,704	37,577	41,400	41,325	14,039	0
SLP	12,828	6,861	9,881	6,847	5,485	-31
Statewide	136,769	122,409	100,561	103,843	20,795	3
Squirrels						
UP	47,745	56,052	39,009	36,782	12,016	-6
NLP	324,200	171,061	168,707	158,726	21,191	-6
SLP	357,930	323,983	297,621	236,550	31,653	-21
Statewide	729,875	551,097	505,337	432,058	40,926	-15
American crow						
UP	4,574	6,477	5,938	7,506	4,765	26
NLP	13,388	31,143	20,098	16,187	6,604	-19
SLP	30,139	37,229	32,444	27,893	8,643	-14
Statewide	48,101	74,850	58,480	51,586	11,992	-12
Coyote						
UP	131,284	20,885	19,053	32,567	13,281	71
NLP	66,657	86,395	90,332	96,224	24,397	7
SLP	118,940	121,267	112,024	99,300	21,193	-11
Statewide	316,881	228,547	221,409	228,092	35,033	3

[a]Included both regular and late pheasant hunting seasons.

*Non-overlapping 95% confidence intervals indicated estimates differed significantly (P<0.005).

Table 6. Estimated small game harvest by species and region in Michigan, 2006-2009.

Species and region	2006	2007	2008	2009 No.	2009 95% CL	2008-09 % Change
Ring-necked pheasant[a]						
UP	7,841	3,765	4,796	2,991	1,429	-38
NLP	29,214	22,317	25,528	12,602	2,978	-51*
SLP	57,703	39,736	32,598	20,492	4,143	-37*
Statewide	94,758	65,817	62,922	36,085	5,917	-43*
Northern bobwhite quail						
NLP	0	74	2	357	625	>100
SLP	3,212	1,511	853	1,116	1,212	31
Statewide	3,212	1,585	854	1,473	1,672	72
Ruffed grouse						
UP	154,473	193,227	183,804	144,682	16,016	-21*
NLP	101,793	100,163	106,329	88,936	11,885	-16
SLP	14,568	9,667	10,858	7,157	2,555	-34
Statewide	270,834	303,057	300,990	240,775	20,693	-20*
American woodcock						
UP	40,167	31,623	28,699	27,059	6,656	-6
NLP	70,748	72,233	79,190	53,098	9,768	-33*
SLP	23,221	8,983	13,801	11,087	5,016	-20
Statewide	134,136	112,838	121,690	91,244	13,752	-25
Cottontail rabbit						
UP	7,438	8,248	7,818	9,935	5,195	27
NLP	74,707	58,268	79,068	52,058	12,251	-34*
SLP	358,970	299,430	269,207	214,118	25,804	-20
Statewide	441,116	365,946	356,093	276,112	30,872	-22
Snowshoe hare						
UP	44,258	29,937	30,892	25,820	1,665	-16*
NLP	15,570	9,530	10,419	9,890	1,493	-5
SLP	5,955	2,892	4,491	2,171	11,712	-52
Statewide	65,783	42,360	45,802	37,881	10,369	-17
Squirrels						
UP	38,012	65,161	39,965	34,840	11,712	-13
NLP	311,378	176,428	196,157	172,735	25,112	-12
SLP	359,526	265,225	304,433	232,756	24,477	-24*
Statewide	708,917	506,814	540,555	440,330	38,418	-19*
American crow						
UP	4,258	7,038	9,178	20,615	23,824	125
NLP	39,827	37,688	30,032	23,606	13,161	-21
SLP	28,240	35,350	22,471	28,219	9,275	26
Statewide	72,325	80,076	61,681	72,440	29,336	17
Coyote						
UP	3,869	4,530	2,888	4,386	1,697	52
NLP	9,762	17,567	19,531	16,278	5,429	-17
SLP	19,599	14,387	17,035	18,692	9,276	10
Statewide	33,231	36,485	39,454	39,356	11,006	0

[a]Included both regular and late pheasant hunting seasons.

*Non-overlapping 95% confidence intervals indicated estimates differed significantly (P<0.005).

Table 7. Estimated number of coyote hunters, coyotes harvested, and hunting effort (days afield) by small game hunters with and without a fur harvesters license in Michigan, 2009.[a]

	Hunters		Days afield		Harvest	
Small game hunter group	No.	95% CL	No.	95% CL	No.	95% CL
Without fur harvesters license	25,594	2,046	149,764	27,965	25,651	9,959
With fur harvesters license	9,062	1,256	78,328	21,503	13,705	4,740
Combined	34,656	2,332	228,092	35,033	39,356	11,006

[a]Coyotes can also be taken by hunters possessing either a small game hunting or a fur harvesters license. These estimates do not include people with only a fur harvesters license that hunted coyotes.

Table 8. Estimated number and proportion of hunters hunting on private and public lands during the 2009 small game hunting season, summarized by species.

	Land type															
	Private land only				Public land only				Both private and public lands				Unknown land			
Species	Total	95% CL	%	95% CL	Total	95% CL	%	95% CL	Total	95% CL	%	95% CL	Total	95% CL	%	95% CL
Ring-necked pheasant	19,771	1,819	58	4	5,367	975	16	3	7,225	1,126	21	3	1,651	541	5	2
Northern bobwhite quail	739	369	54	18	148	165	11	11	292	232	21	15	194	188	14	13
Ruffed grouse	13,735	1,521	17	2	34,260	2,265	41	2	31,534	2,113	38	2	3,288	760	4	1
American woodcock	5,396	976	14	2	16,305	1,627	43	3	12,049	1,427	32	3	3,943	826	10	2
Cottontail rabbit	35,373	2,338	52	3	10,316	1,341	15	2	18,358	1,760	27	2	3,836	826	6	1
Snowshoe hare	2,552	670	16	4	7,077	1,101	43	5	5,745	989	35	5	1,013	418	6	2
Squirrels	32,317	2,259	44	2	17,952	1,736	25	2	18,593	1,767	25	2	4,154	862	6	1
American crow	7,882	1,177	61	6	1,781	566	14	4	2,560	679	20	5	722	361	6	3
Coyote	20,509	1,852	59	4	4,982	939	14	3	7,564	1,144	22	3	1,600	539	5	2
Combined	51,607	2,730	31	2	36,962	2,354	22	1	66,907	2,965	40	2	10,592	1,351	6	1

Table 9. Estimated number of days of hunting effort on private and public lands during the 2009 small game hunting season in Michigan, summarized by species.[a]

	Land type							
	Private lands		Public lands		Both private and public lands		Unknown	
Species	Total	95% CL	Total	95% CL	Total	95% CL	Total	95% CL
Ring-necked pheasant	79,718	10,820	28,512	7,777	32,441	8,629	7,524	4,140
Northern bobwhite quail	3,251	1,988	345	370	1,675	1,882	510	898
Ruffed grouse	69,904	11,319	241,505	26,824	249,682	28,918	21,791	10,274
American woodcock	25,547	8,613	100,704	17,285	75,649	14,045	25,837	9,533
Cottontail rabbit	176,002	20,145	75,242	18,970	142,842	28,541	20,537	6,550
Snowshoe hare	15,819	6,453	41,349	11,994	40,807	13,030	5,867	4,102
Squirrels	154,072	18,897	119,533	21,926	130,706	23,934	27,747	9,052
American crow	27,008	8,486	9,774	5,480	13,489	6,152	1,315	879
Coyote	126,417	25,476	32,277	11,794	58,371	16,944	11,027	12,004

[a]People that hunted small game on both private and public lands were not asked to record the amount of effort separately for each land type; thus, it was not possible to estimate the total amount or proportion of effort devoted to either private or public lands separately.

Table 10. Level of satisfaction among active small game hunters (% of hunters) with the 2009 small game hunting season in Michigan.[a]

	Level of satisfaction									
	Very satisfied		Somewhat satisfied		Neutral		Somewhat dissatisfied		Very dissatisfied	
Index used to measure season satisfaction	%	95% CL	%	95% CL	%	95% CL	%	95% CL	%	95% CL
Small game seen	11	1	27	2	19	1	25	2	18	1
Small game harvested	9	1	20	1	25	2	24	2	22	1
Length of season	32	2	26	2	30	2	8	1	4	1
Overall experience	24	2	34	2	22	1	13	1	7	1

[a]Analyses limited to small game license buyers that actually hunted in 2009 and indicated a level of satisfaction.

Table 11. Estimated number of Michigan woodcock hunters, woodcock harvested, and hunting effort (days afield) among people that registered with the Harvest Information Program, 2009.[a]

Variable	No.	95% CL
Hunters	32,674	2,235
Days afield (effort)	198,489	23,407
Harvest	82,696	13,164

[a]Analyses limited to people that registered with HIP and hunted woodcock.

Table 12. Proportion and number of small game license buyers that hunted waterfowl in Michigan during 2009.

Hunted waterfowl	%	95% CL	Total	95% CL
Yes	20.1	1.0	53,553	2,766
No	12.4	0.9	33,014	2,275
No; I've never hunted waterfowl.	28.9	1.2	76,992	3,141
No; I only briefly tried waterfowl hunting.	13.1	0.9	35,008	2,342
No; I really tried getting into waterfowl hunting, but didn't stick with it.	1.6	0.3	4,321	877
No; I used to waterfowl hunt, but no longer do.	12.0	0.8	31,871	2,239
No; I hunt waterfowl, but just haven't done so recently	9.4	0.8	25,051	2,013
No answer	2.5	0.4	6,740	1,085

Table 13. Proportion and number of waterfowl hunters in Michigan during 2009, summarized by hunter type.

	Small game license buyers				Waterfowl hunters[a]			
Type of waterfowl hunter	%	95% CL	Total	95% CL	%	95% CL	Total	95% CL
I'm not involved in waterfowl hunting now, but could see myself becoming a waterfowl hunter at some point in the future.	22.8	1.1	60,882	2,910	0.9	0.5	481	295
I'm learning how to become a waterfowl hunter.	6.1	0.6	16,258	1,658	14.8	2.1	7,950	1,182
I think of myself as a waterfowl hunter.	18.8	1.0	49,988	2,687	72.0	2.6	38,575	2,430
I used to think of myself as a waterfowl hunter, but no longer think of myself in those terms.	8.6	0.7	22,985	1,934	2.8	1.0	1,495	520
I don't think of myself as a waterfowl hunter even though I have occasionally gone waterfowl hunting.	13.3	0.9	35,406	2,351	8.6	1.6	4,626	909
I don't think of myself as a waterfowl hunter and don't see myself becoming one.	26.5	1.1	70,645	3,047	0.1	0.2	49	96
No answer	3.9	0.5	10,384	1,338	0.7	0.5	376	258

[a]Among small game license buyers that reported hunting waterfowl in 2009.

Table 14. Proportion and number of waterfowl hunters in Michigan, Arkansas, Illinois, and Virginia, summarized by hunter type.

Type of waterfowl hunter	State			
	Michigan[a]	Arkansas[b]	Illinois[c]	Virginia[d]
I'm not involved in waterfowl hunting now, but could see myself becoming a waterfowl hunter at some point in the future.	0.9	1.0	0.4	NA[e]
I'm learning how to become a waterfowl hunter.	15.0	11.0	9.6	11.9
I think of myself as a waterfowl hunter.	72.5	80.0	76.9	70.6
I used to think of myself as a waterfowl hunter, but no longer think of myself in those terms.	2.8	4.0	5.6	6.5
I don't think of myself as a waterfowl hunter even though I have occasionally gone waterfowl hunting.	8.7	4.0	6.6	10.0
I don't think of myself as a waterfowl hunter and don't see myself becoming one.	0.1	NA[e]	0.9	1.0

[a]For comparisons to other states, "no answer" was excluded from summary.
[b]Responsive Management (2010)
[c]Lischka et al. (2011)
[d]Jagnow et al. (2010)
[e]Not available because not included as an answer on survey.

Table 15. Likelihood that small game license buyers and waterfowl hunters would hunt waterfowl during the next five years.

	Small game license buyers				Waterfowl hunters			
Likelihood	%	95% CL	Total	95% CL	%	95% CL	Total	95% CL
Very likely	24.5	1.1	65,275	2,963	80.0	2.3	42,863	2,536
Somewhat likely	11.4	0.8	30,460	2,205	9.8	1.7	5,272	966
Slightly likely	8.8	0.7	23,580	1,968	2.7	0.9	1,452	513
Undecided	11.7	0.8	31,078	2,228	1.8	0.8	973	421
Slightly unlikely	2.3	0.4	6,122	1,039	0.2	0.2	95	131
Somewhat unlikely	7.4	0.7	19,616	1,808	0.4	0.4	239	207
Very unlikely	27.6	1.2	73,678	3,079	1.6	0.7	868	397
No answer	6.3	0.6	16,740	1,681	3.3	1.0	1,790	569

Table 16. Likelihood that waterfowl hunters would hunt waterfowl during the next five years in Michigan, Arkansas, and Virginia.

	State		
Likelihood	Michigan[a]	Arkansas[b]	Virginia[c]
Very likely	82.8	87.0	89.0
Somewhat likely	10.2	8.0	8.8
Slightly likely	2.8	1.0	NA[d]
Undecided	1.9	2.0	NA[d]
Slightly unlikely	0.2	0.0	NA[d]
Somewhat unlikely	0.5	0.0	1.0
Very unlikely	1.7	1.0	1.2

[a]For comparisons to other states, “no answer” was excluded from summary.
[b]Responsive Management (2010)
[c]Jagnow et al. (2010)
[d]Not available because not included as an answer on survey.

Table 17. Proportion and number of Michigan waterfowl hunters currently or formerly a mentor to another waterfowl hunter in 2009.

	Currently a mentor to another waterfowl hunter				Formerly a mentor to another waterfowl hunter				Currently or formerly a mentor to another waterfowl hunter			
Was hunter a mentor	%	95% CL	Total	95% CL	%	95% CL	Total	95% CL	%	95% CL	Total	95% CL
Yes	41.6	2.9	22,256	1,918	52.9	2.9	28,321	2,130	60.4	2.8	32,361	2,258
No	57.6	2.9	30,871	2,213	46.7	2.9	24,989	2,020	39.2	2.8	20,998	1,867
No answer	0.8	0.5	426	276	0.5	0.4	243	211	0.4	0.4	194	188

Table 18. Proportion and number of waterfowl hunters currently or formerly a mentor to another waterfowl hunter in Michigan, Arkansas, Illinois, and Virginia during 2009.

	Currently a mentor to another waterfowl hunter				Formerly a mentor to another waterfowl hunter			
	State				State			
Was hunter a mentor	Michigan[a]	Arkansas[b]	Illinois[c]	Virginia[d]	Michigan[a]	Arkansas[b]	Illinois[c]	Virginia[d]
Yes	41.9	52.0	38.6	46.6	53.1	65.0	52.6	60.2
No	58.1	48.0	61.4	53.4	46.9	35.0	47.4	39.8

[a]For comparisons to other states, "no answer" was excluded from summary.
[b]Responsive Management (2010)
[c]Lischka et al. (2011)
[d]Jagnow et al. (2010)

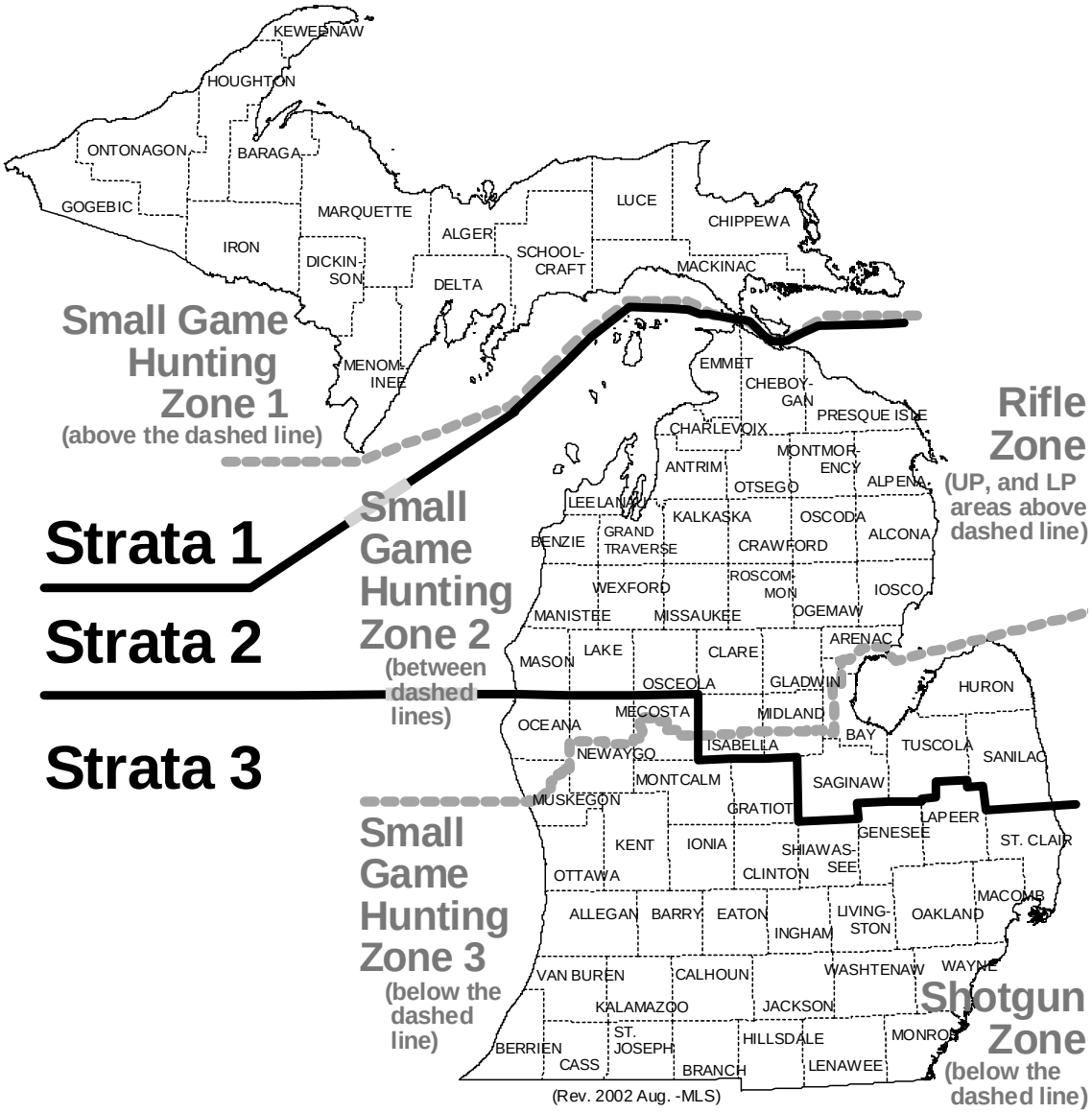

Figure 1. Areas (strata) used to summarize the survey data (top). Stratum boundaries did not match the small game management hunting zones.

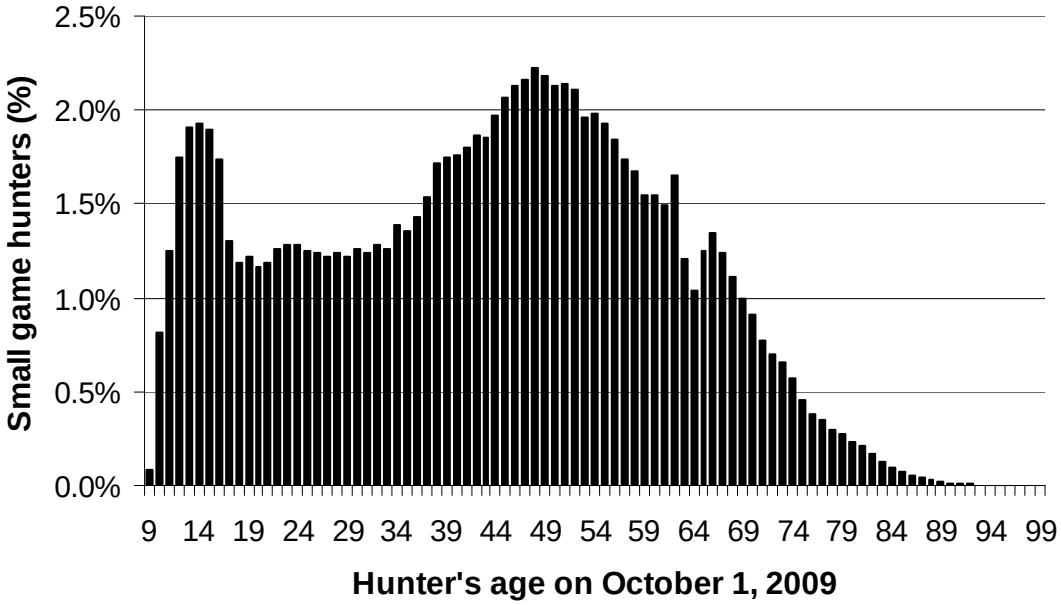

Figure 2. Age of people that purchased a small game hunting license in Michigan for the 2009 hunting seasons ($\bar{x}$ = 43 years).

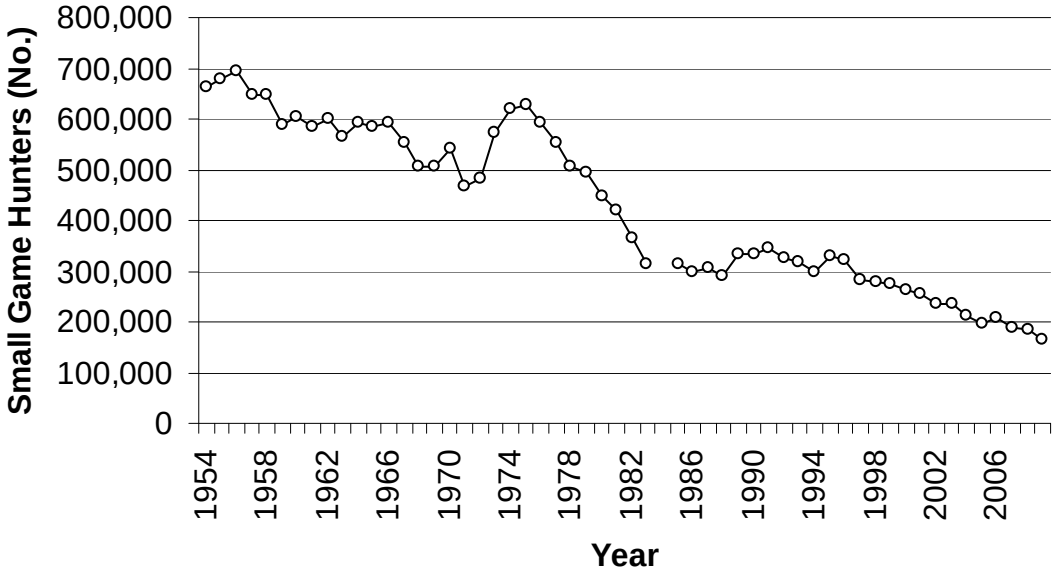

Figure 3. Estimated number of small game hunters in Michigan, 1954-2009 (estimate of the number of people that went afield). No estimate was available for 1984.

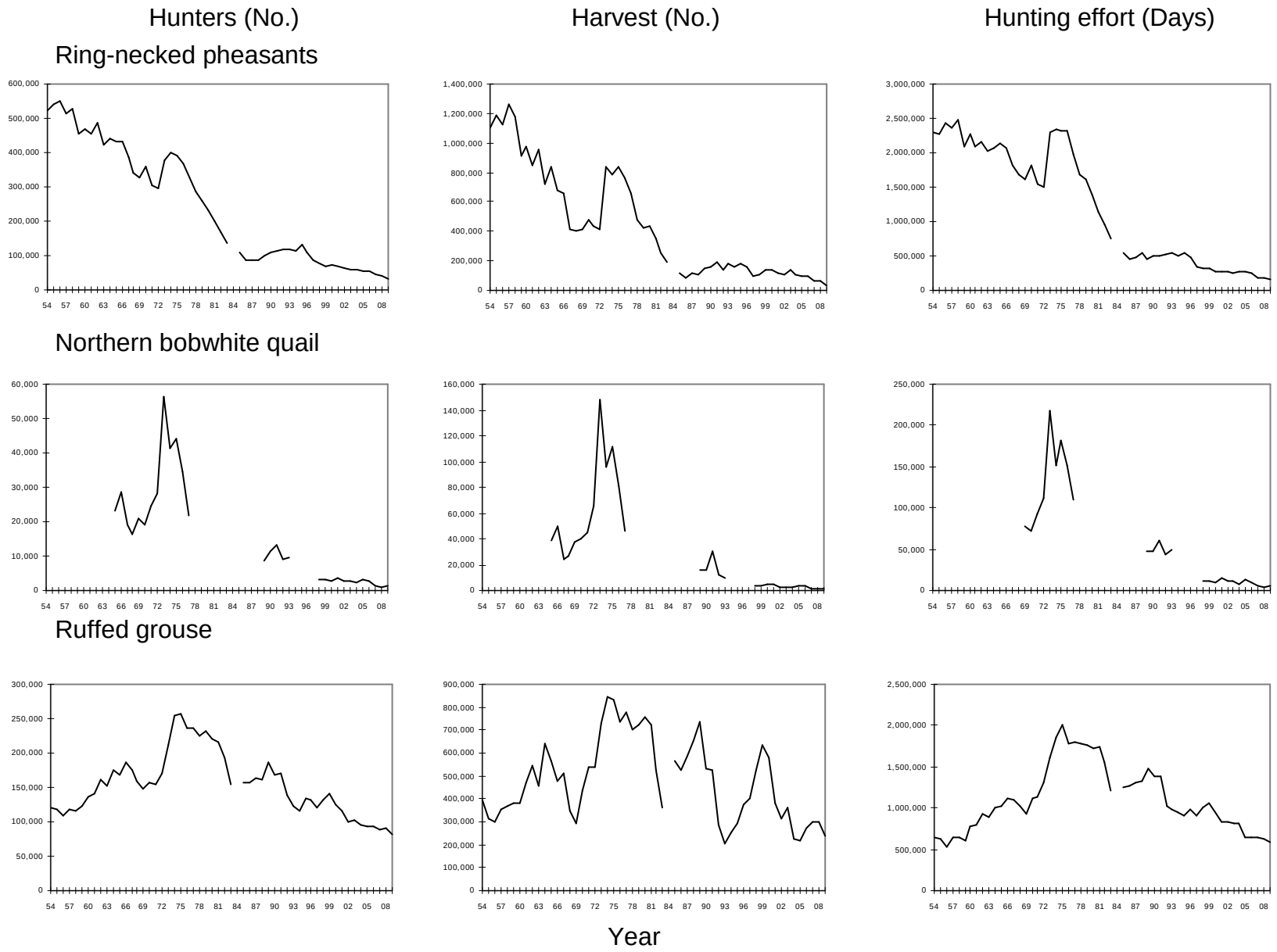

Figure 4. Estimated number of hunters, harvest, and hunting effort in Michigan during the small game hunting seasons, 1954-2009. No estimates were available or no seasons existed during years when no data are plotted.

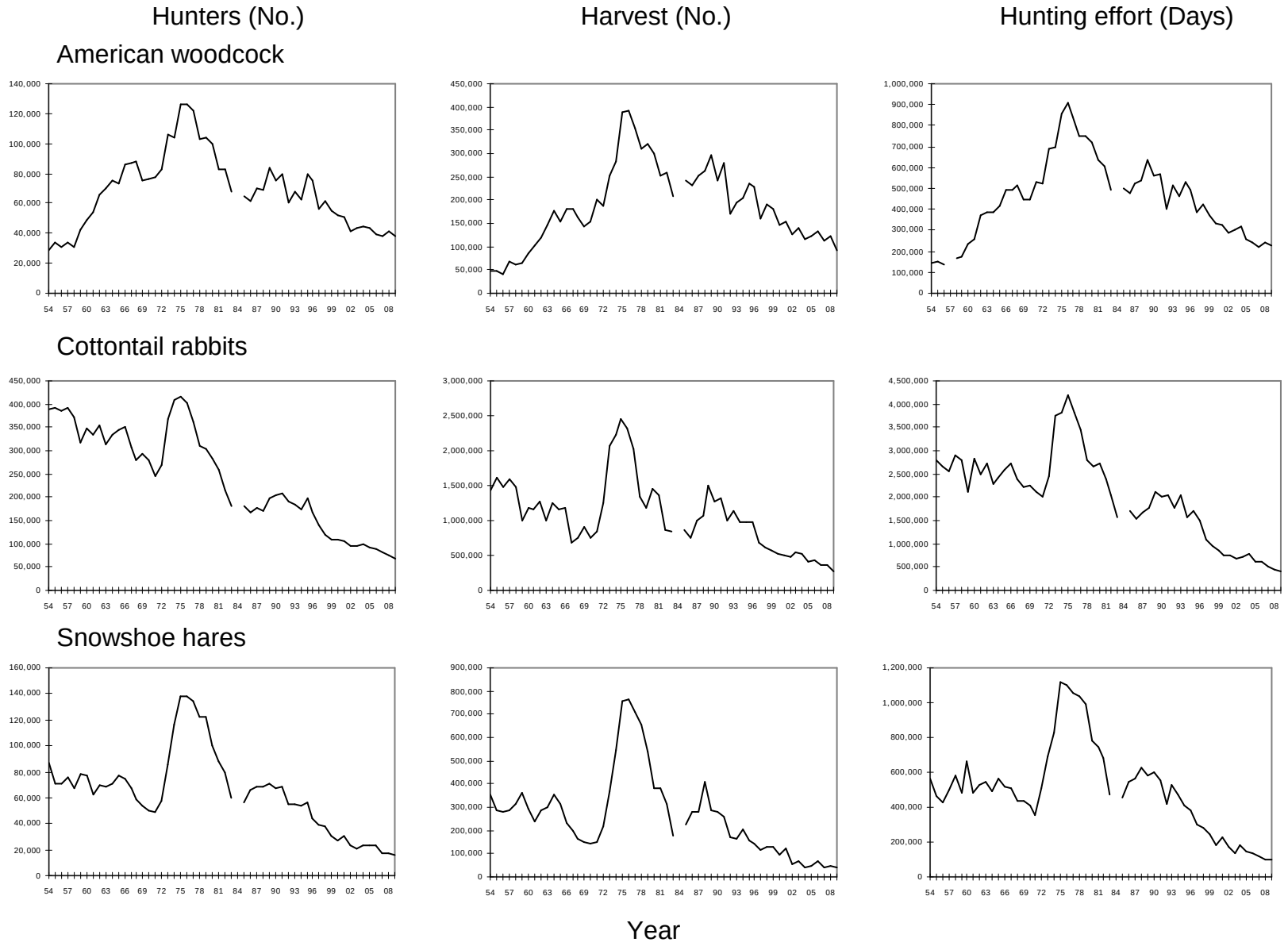

Figure 4 (continued). Estimated number of hunters, harvest, and hunting effort in Michigan during the small game hunting seasons, 1954-2009. No estimates were available or no seasons existed during years when no data are plotted.

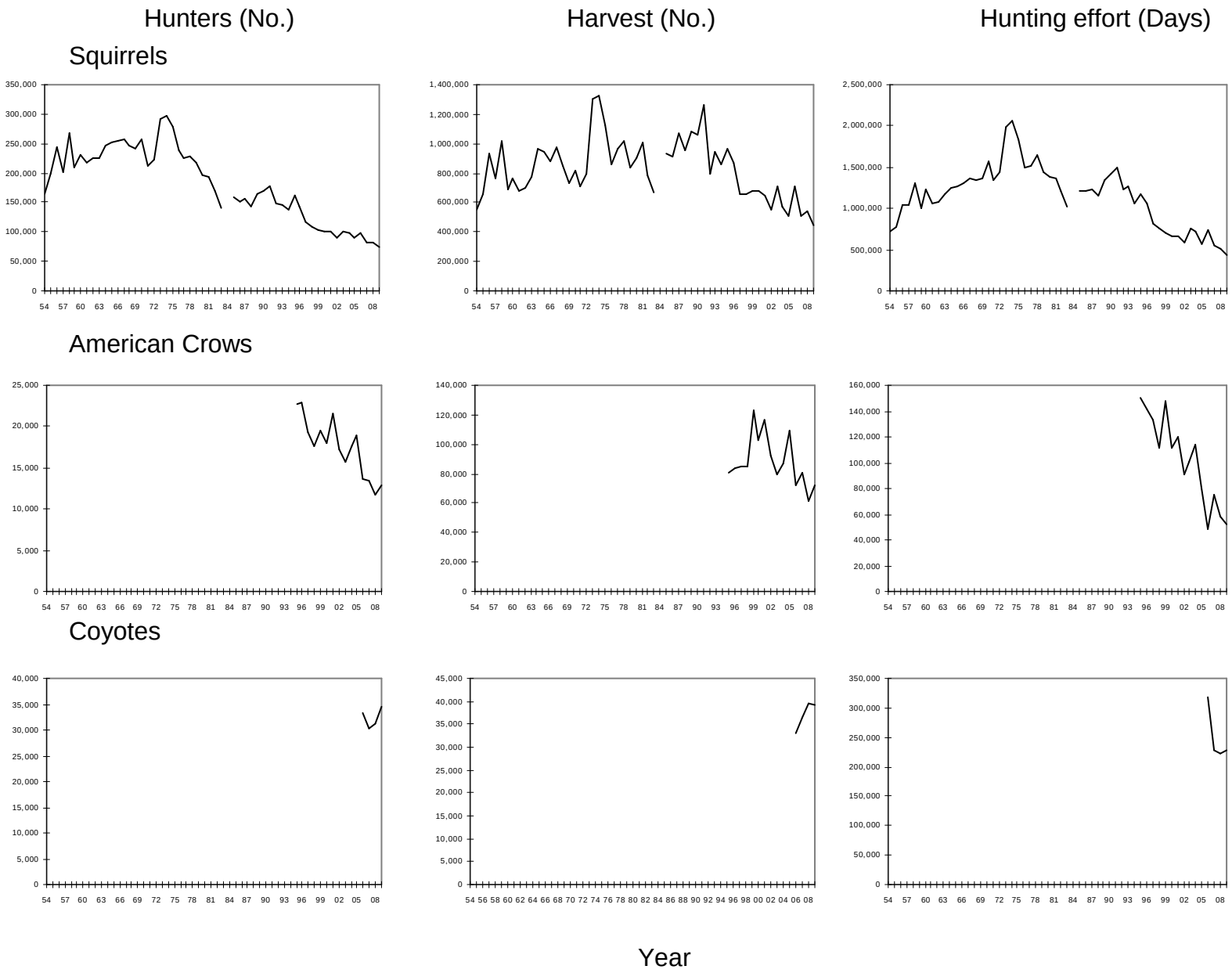

Figure 4. (continued) Estimated number of hunters, harvest, and hunting effort in Michigan during the small game hunting seasons, 1954-2009. No estimates were available or no seasons existed during years when no data are plotted.

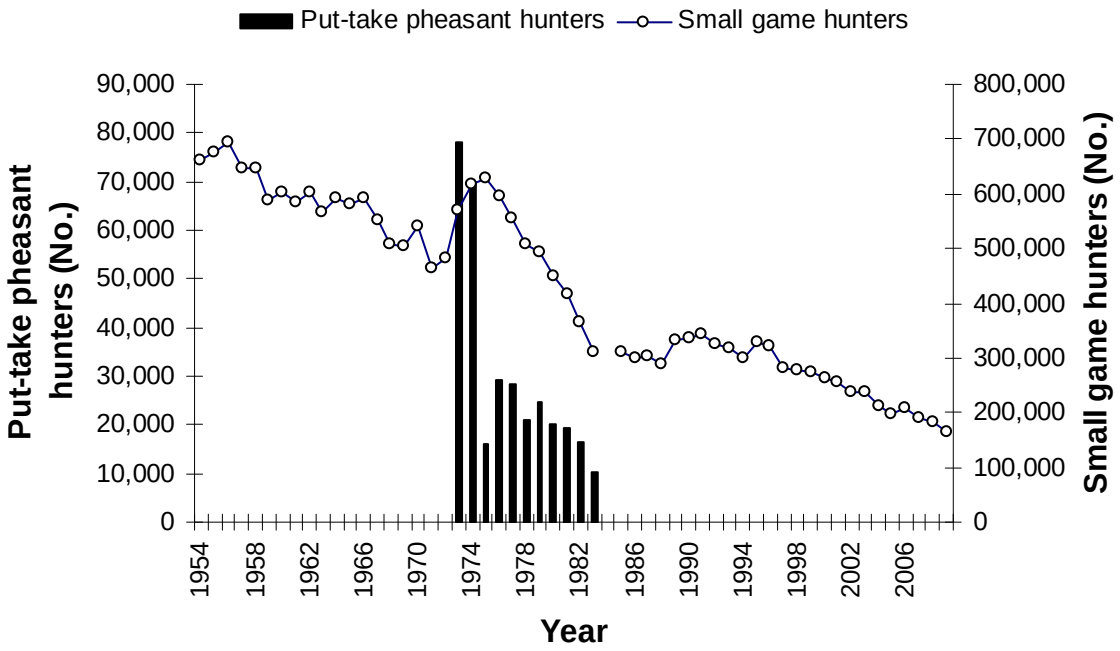

Figure 5. Estimated number of small game hunters in Michigan, 1954-2009 (estimate of the number of people that went afield) and number of people participating in put-take pheasant hunts (1973-1983). The numbers of put-take pheasant hunters were estimated for 1973-1974 (Janson 1975, Janson and Anderson 1976), while numbers of hunters during 1975-1983 were tallies of annual put-take permits sold (DNR, unpublished data). Thus, the estimates of put-take hunters during 1973-1975 and 1976-1983 periods are not directly comparable. No estimates of small game hunters or put-take pheasant hunters were available for 1984.

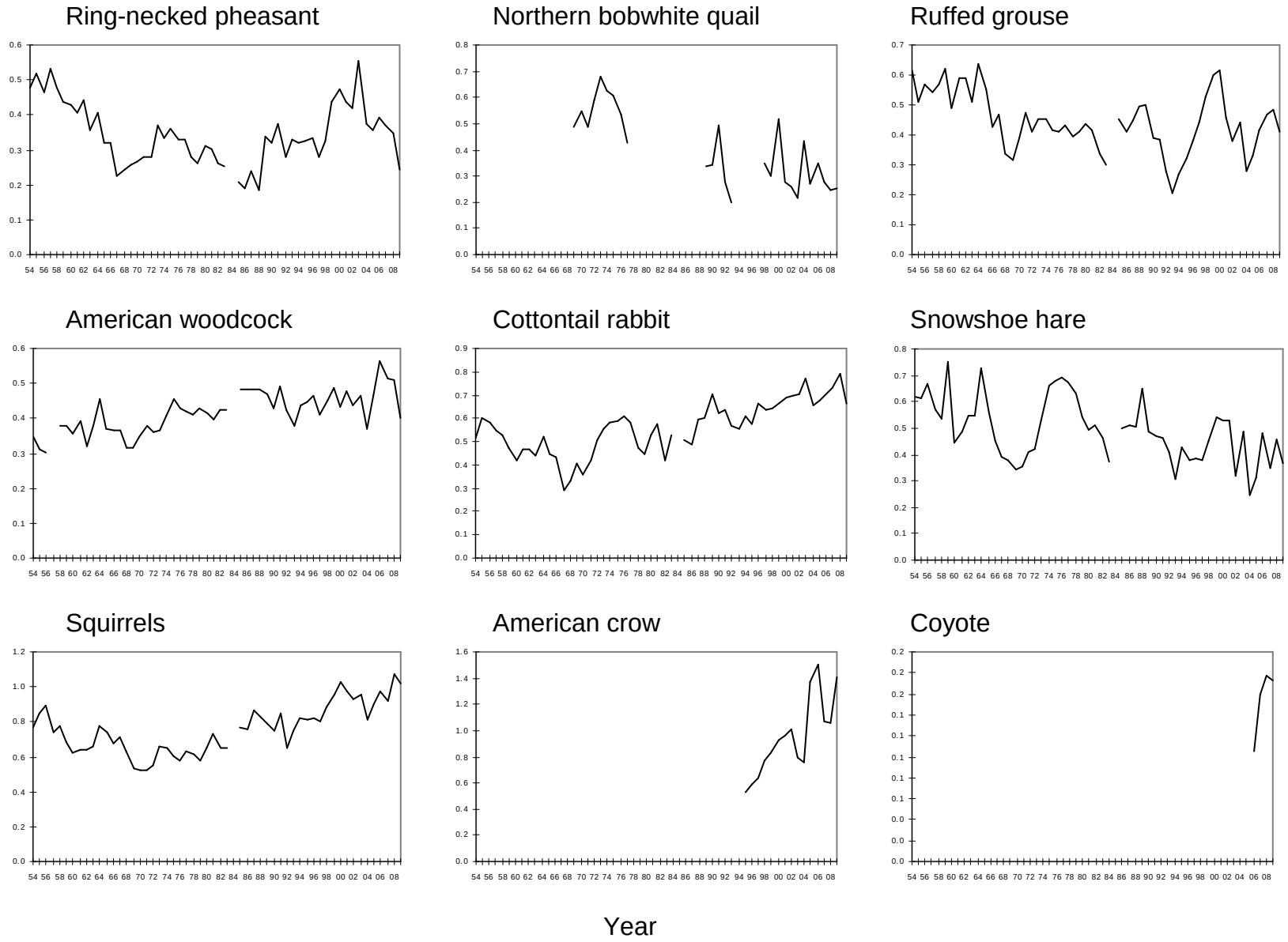

Figure 6. Estimated harvest per effort in Michigan during the small game hunting seasons, 1954-2009. No estimates were available or no seasons existed during years when no data are plotted.

Appendix A

2009-2010 Small Game Harvest Questionnaire

MICHIGAN DEPARTMENT OF NATURAL RESOURCES & ENVIRONMENT, WILDLIFE DIVISION
PO BOX 30030 LANSING MI 48909-7530

2009-2010 UPLAND GAME HARVEST REPORT

This information is requested under authority of Part 435, 1994 PA 451, M.C.L. 324.43539.

It is important that you complete and return this questionnaire even if you did not hunt or harvest any animals. *Report only* ***your*** *hunting activities and the animals that* ***you*** *harvested. Do not report any game taken on a licensed shooting preserve.*

1. Did you attempt to hunt upland small game species in Michigan during 2009-10?

1 ☐ Yes. Please complete the table below.

2 ☐ No. Skip to Question #3.

SPECIES *(Check box if you hunted during the season.)*	COUNTY HUNTED *(List the counties hunted on separate lines.)*	NUMBER OF DAYS HUNTED (Include all days hunted, even if you did not harvest anything.)	TYPE OF LAND	NUMBER OF ANIMALS TAKEN
0 [X] **Example**	1 Jackson	5	1 [X] Private 2 ☐ Public 3 ☐ Both	12
1 ☐ **Pheasant** (Do not count birds taken on a licensed shooting preserve)	1		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	2		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	3		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	4		1 ☐ Private 2 ☐ Public 3 ☐ Both	
2 ☐ **Ruffed Grouse**	1		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	2		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	3		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	4		1 ☐ Private 2 ☐ Public 3 ☐ Both	
3 ☐ **Woodcock**	1		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	2		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	3		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	4		1 ☐ Private 2 ☐ Public 3 ☐ Both	
4 ☐ **Cottontail Rabbit**	1		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	2		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	3		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	4		1 ☐ Private 2 ☐ Public 3 ☐ Both	
5 ☐ **Snowshoe Hare**	1		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	2		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	3		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	4		1 ☐ Private 2 ☐ Public 3 ☐ Both	
6 ☐ **Squirrel**	1		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	2		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	3		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	4		1 ☐ Private 2 ☐ Public 3 ☐ Both	
7 ☐ **Crow**	1		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	2		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	3		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	4		1 ☐ Private 2 ☐ Public 3 ☐ Both	
8 ☐ **Quail** (Portions of the Southern Lower Peninsula)	1		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	2		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	3		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	4		1 ☐ Private 2 ☐ Public 3 ☐ Both	
9 ☐ **Coyote**	1		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	2		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	3		1 ☐ Private 2 ☐ Public 3 ☐ Both	
	4		1 ☐ Private 2 ☐ Public 3 ☐ Both	

Questions continued on back

2. During the last upland small game hunting season, how satisfied or dissatisfied were you with:	Very Satisfied	Somewhat Satisfied	Neutral	Somewhat Dissatisfied	Very Dissatisfied
a. The amount of small game seen.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
b. Number of small game harvested.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
c. Number of days in the hunting season.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
d. Your overall hunting experience.	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

3. Please help us understand how you think about yourself and waterfowl hunting by selecting the one category that best describes you (please answer even if you don't hunt waterfowl). *(Check one.)*

1 ☐ I'm not involved in waterfowl hunting now, but could see myself becoming a waterfowl hunter at some point in the future.

2 ☐ I'm learning how to become a waterfowl hunter.

3 ☐ I think of myself as a waterfowl hunter.

4 ☐ I used to think of myself as a waterfowl hunter, but no longer think of myself in those terms.

5 ☐ I don't think of myself as a waterfowl hunter even though I have occasionally gone waterfowl hunting.

6 ☐ I don't think of myself as a waterfowl hunter and don't see myself becoming one.

4. Did you attempt to hunt ducks or geese in Michigan during 2009-10?

1 ☐ Yes.

2 ☐ No. Please indicate the category that best describes your past involvement in waterfowl hunting. (Check one)

3 ☐ I've never hunted waterfowl.

4 ☐ I only briefly tried waterfowl hunting.

5 ☐ I really tried getting into waterfowl hunting, but didn't stick with it.

6 ☐ I used to waterfowl hunt, but no longer do.

7 ☐ I hunt waterfowl, but just haven't done so recently.

5. If you are a youth (*adults skip to question 6*), did you hunt during Michigan's Youth Waterfowl Hunting weekend (September 19-20, 2009)? Eligible youth were 10-15 years old during the youth season.

1 ☐ Yes 2 ☐ No

6. Please indicate how likely it is you will hunt waterfowl during the next five years?

1 ☐	2 ☐	3 ☐	4 ☐	5 ☐	6 ☐	7 ☐
Very likely.	Somewhat likely.	Slightly likely.	Undecided.	Slightly Unlikely.	Somewhat Unlikely.	Very Unlikely.

7. Are you currently serving as a mentor or primary person helping another individual become a waterfowl hunter?

1 ☐ Yes 2 ☐ No

8. In the past, have you served as a mentor or primary person helping another individual become a waterfowl hunter?

1 ☐ Yes 2 ☐ No

Please return questionnaire in the enclosed postage-paid envelope.
Thank you for your help!

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